SPEC® CPU2017 Floating Point Rate Result

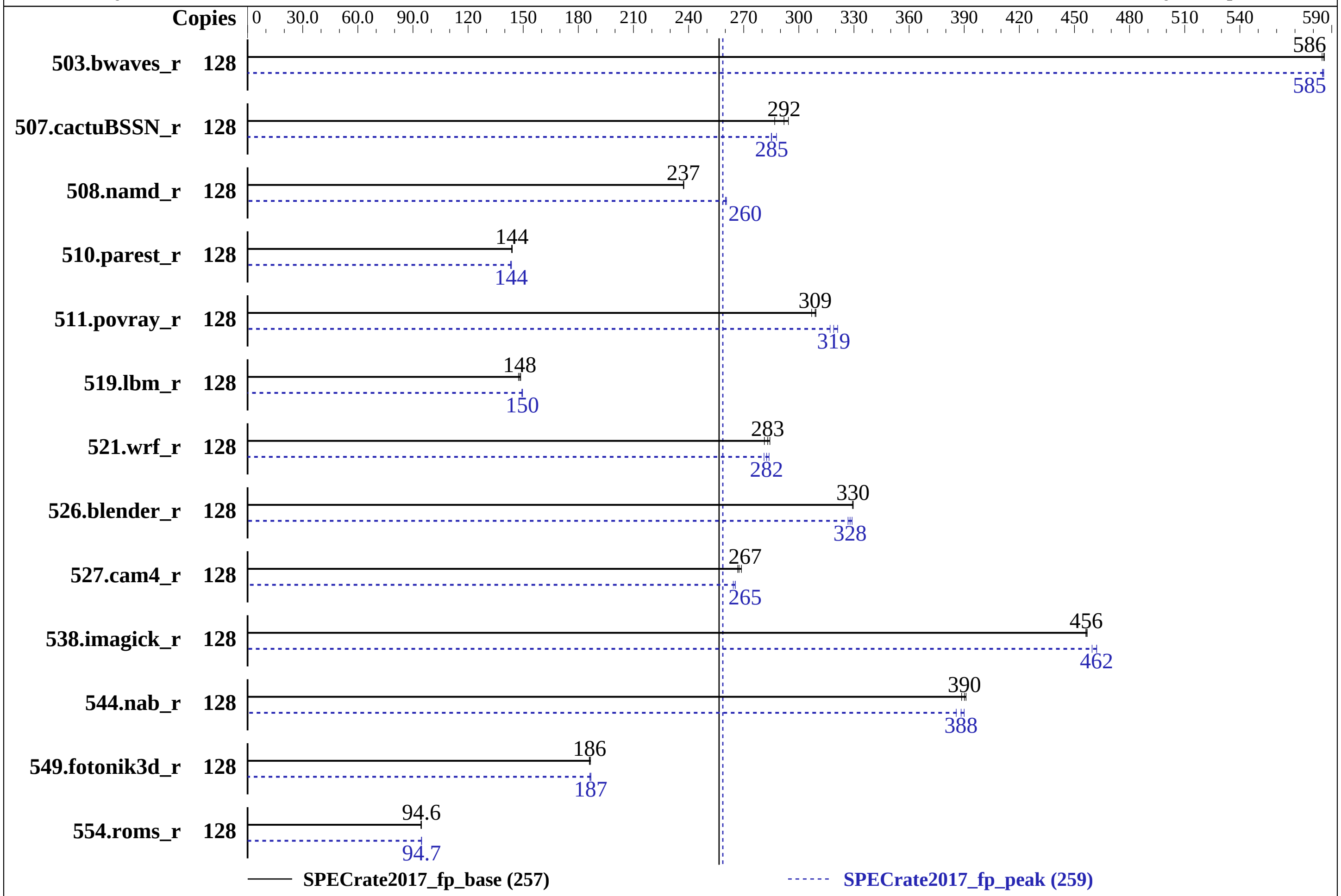
Dell Inc.

PowerEdge R7425
(AMD EPYC 7601, 2.20 GHz)

SPECrate2017_fp_base = 257

SPECrate2017_fp_peak = 259

CPU2017 License:	55	**Test Date:**	Nov-2017
Test Sponsor:	Dell Inc.	**Hardware Availability:**	Dec-2017
Tested by:	Dell Inc.	**Software Availability:**	Sep-2017



Hardware

CPU Name:	AMD EPYC 7601
Max MHz.:	3200
Nominal:	2200
Enabled:	64 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	64 KB I + 32 KB D on chip per core
L2:	512 KB I+D on chip per core
L3:	64 MB I+D on chip per chip, 8 MB shared / 4 cores
Other:	None
Memory:	1 TB (16 x 64 GB 4Rx4 PC4-2666V-L)
Storage:	1 x 960 GB SATA SSD
Other:	None

Software

OS:	Ubuntu 17.04 kernel 4.10.0-24
Compiler:	C/C++: Version 1.0.0 of AOCC Fortran: Version 4.8.2 of GCC
Parallel:	No
Firmware:	Version 1.0.2 released Nov-2017
File System:	ext4
System State:	Run level 5 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other:	jemalloc memory allocator library, version 4.5.0

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	128	2190	586	2195	585	**2192**	**586**	128	2192	586	**2194**	**585**	2194	585
507.cactuBSSN_r	128	565	287	**555**	**292**	551	294	128	563	288	**568**	**285**	569	285
508.namd_r	128	513	237	512	237	**513**	**237**	128	467	261	**467**	**260**	468	260
510.parest_r	128	2330	144	**2327**	**144**	2325	144	128	**2333**	**144**	2340	143	2332	144
511.povray_r	128	966	309	974	307	**968**	**309**	128	931	321	**937**	**319**	943	317
519.lbm_r	128	908	149	**911**	**148**	915	147	128	904	149	**902**	**150**	902	150
521.wrf_r	128	1009	284	1020	281	**1013**	**283**	128	1010	284	**1015**	**282**	1020	281
526.blender_r	128	**592**	**330**	592	329	591	330	128	597	327	**595**	**328**	593	329
527.cam4_r	128	839	267	833	269	**837**	**267**	128	847	264	844	265	**844**	**265**
538.imagick_r	128	698	456	697	457	**697**	**456**	128	**689**	**462**	689	462	693	460
544.nab_r	128	554	389	**552**	**390**	551	391	128	552	390	**555**	**388**	559	386
549.fotonik3d_r	128	2682	186	2672	187	**2679**	**186**	128	2670	187	**2671**	**187**	2678	186
554.roms_r	128	2150	94.6	**2150**	**94.6**	2157	94.3	128	**2148**	**94.7**	2150	94.6	2147	94.7

SPECrate2017_fp_base = **257**

SPECrate2017_fp_peak = **259**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

```
The config file option 'submit' was used.
'numactl' was used to bind copies to the cores.
See the configuration file for details.
```

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory
sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were
all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages were enabled for this run (OS default)

Huge pages were not configured for this run.
```

General Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/amd1704-rate-libs-revB/64;/home/cpu2017/amd1704-rate-libs-revB/32:"
MALLOC_CONF = "lg_chunk:28"

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc
The AOCC Gold Linker plugin was installed and used for the link stage.
The AOCC Fortran Plugin version 1.0 was used to leverage AOCC optimizers
with gfortran.

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using RHEL 7.4

jemalloc, a general purpose malloc implementation, was obtained at
https://github.com/jemalloc/jemalloc/releases/download/4.5.0/jemalloc-4.5.0.tar.bz2
jemalloc was built with GCC v4.8.5 in RHEL v7.2 under default conditions.
jemalloc uses environment variable MALLOC_CONF with values narenas and lg_chunk:
  narenas: sets the maximum number of arenas to use for automatic multiplexing
           of threads and arenas.
  lg_chunk: set the virtual memory chunk size (log base 2). For example,
            lg_chunk:21 sets the default chunk size to 2^21 = 2MiB.

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on
past performance using the historical hardware and/or
software described on this result page.

The system as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result
that would be measured were this benchmark run with hardware
and software available as of the publication date.
```

Platform Notes

```
BIOS settings:
Memory Interleaving set to Channel Interleaving
```

(Continued on next page)

Platform Notes (Continued)

```
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost enabled
C States disabled
Memory Patrol Scrub disabled
Memory Refresh Rate set to 1x
PCI ASPM L1 Link Power Management disabled
 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on epyc Sun Nov 12 00:43:34 2017

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : AMD EPYC 7601 32-Core Processor
       2  "physical id"s (chips)
       128 "processors"
    cores, siblings (Caution: counting these is hw and system dependent. The following
    excerpts from /proc/cpuinfo might not be reliable.  Use with caution.)
       cpu cores : 32
       siblings  : 64
       physical 0: cores 0 1 2 3 4 5 6 7
       physical 1: cores 0 1 2 3 4 5 6 7

 From lscpu:
      Architecture:          x86_64
      CPU op-mode(s):        32-bit, 64-bit
      Byte Order:            Little Endian
      CPU(s):                128
      On-line CPU(s) list:   0-127
      Thread(s) per core:    2
      Core(s) per socket:    32
      Socket(s):             2
      NUMA node(s):          8
      Vendor ID:             AuthenticAMD
      CPU family:            23
      Model:                 1
      Model name:            AMD EPYC 7601 32-Core Processor
      Stepping:              2
      CPU MHz:               2195.725
      BogoMIPS:              4391.45
      Virtualization:        AMD-V
      L1d cache:             32K
```

(Continued on next page)

Platform Notes (Continued)

```
     L1i cache:              64K
     L2 cache:               512K
     L3 cache:               8192K
     NUMA node0 CPU(s):      0,8,16,24,32,40,48,56,64,72,80,88,96,104,112,120
     NUMA node1 CPU(s):      2,10,18,26,34,42,50,58,66,74,82,90,98,106,114,122
     NUMA node2 CPU(s):      4,12,20,28,36,44,52,60,68,76,84,92,100,108,116,124
     NUMA node3 CPU(s):      6,14,22,30,38,46,54,62,70,78,86,94,102,110,118,126
     NUMA node4 CPU(s):      1,9,17,25,33,41,49,57,65,73,81,89,97,105,113,121
     NUMA node5 CPU(s):      3,11,19,27,35,43,51,59,67,75,83,91,99,107,115,123
     NUMA node6 CPU(s):      5,13,21,29,37,45,53,61,69,77,85,93,101,109,117,125
     NUMA node7 CPU(s):      7,15,23,31,39,47,55,63,71,79,87,95,103,111,119,127
     Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
     pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
     constant_tsc rep_good nopl nonstop_tsc extd_apicid amd_dcm aperfmperf pni pclmulqdq
     monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm
     cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw skinit
     wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l2 mwaitx cpb hw_pstate
     vmmcall fsgsbase bmi1 avx2 smep bmi2 rdseed adx smap clflushopt sha_ni xsaveopt
     xsavec xgetbv1 xsaves clzero irperf arat npt lbrv svm_lock nrip_save tsc_scale
     vmcb_clean flushbyasid decodeassists pausefilter pfthreshold avic overflow_recov
     succor smca

 /proc/cpuinfo cache data
    cache size : 512 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0 8 16 24 32 40 48 56 64 72 80 88 96 104 112 120
   node 0 size: 128639 MB
   node 0 free: 128165 MB
   node 1 cpus: 2 10 18 26 34 42 50 58 66 74 82 90 98 106 114 122
   node 1 size: 129004 MB
   node 1 free: 128591 MB
   node 2 cpus: 4 12 20 28 36 44 52 60 68 76 84 92 100 108 116 124
   node 2 size: 129021 MB
   node 2 free: 128619 MB
   node 3 cpus: 6 14 22 30 38 46 54 62 70 78 86 94 102 110 118 126
   node 3 size: 129021 MB
   node 3 free: 128625 MB
   node 4 cpus: 1 9 17 25 33 41 49 57 65 73 81 89 97 105 113 121
   node 4 size: 129021 MB
   node 4 free: 128576 MB
   node 5 cpus: 3 11 19 27 35 43 51 59 67 75 83 91 99 107 115 123
   node 5 size: 129021 MB
   node 5 free: 128614 MB
   node 6 cpus: 5 13 21 29 37 45 53 61 69 77 85 93 101 109 117 125
```

(Continued on next page)

Platform Notes (Continued)

```
    node 6 size: 129021 MB
    node 6 free: 128594 MB
    node 7 cpus: 7 15 23 31 39 47 55 63 71 79 87 95 103 111 119 127
    node 7 size: 129019 MB
    node 7 free: 128615 MB
    node distances:
    node   0   1   2   3   4   5   6   7
      0:  10  16  16  16  28  28  22  28
      1:  16  10  16  16  28  28  28  22
      2:  16  16  10  16  22  28  28  28
      3:  16  16  16  10  28  22  28  28
      4:  28  28  22  28  10  16  16  16
      5:  28  28  28  22  16  10  16  16
      6:  22  28  28  28  16  16  10  16
      7:  28  22  28  28  16  16  16  10

  From /proc/meminfo
     MemTotal:       1056530872 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  /usr/bin/lsb_release -d
     Ubuntu 17.04

  From /etc/*release* /etc/*version*
     debian_version: stretch/sid
     os-release:
        NAME="Ubuntu"
        VERSION="17.04 (Zesty Zapus)"
        ID=ubuntu
        ID_LIKE=debian
        PRETTY_NAME="Ubuntu 17.04"
        VERSION_ID="17.04"
        HOME_URL="https://www.ubuntu.com/"
        SUPPORT_URL="https://help.ubuntu.com/"

  uname -a:
     Linux epyc 4.10.0-24-generic #28-Ubuntu SMP Wed Jun 14 08:14:34 UTC 2017 x86_64 x86_64
     x86_64 GNU/Linux

  run-level 5 Jun 27 20:06

  SPEC is set to: /home/cpu2017
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda2      ext4  880G  8.9G  826G   2% /

  Additional information from dmidecode follows.  WARNING: Use caution when you interpret
```

(Continued on next page)

Platform Notes (Continued)

```
this section. The 'dmidecode' program reads system data which is "intended to allow
hardware to be accurately determined", but the intent may not be met, as there are
frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
  BIOS Dell Inc. 1.0.2 11/03/2017
  Memory:
   16x 802C8632802C 72ASS8G72LZ-2G6B2 64 GB 4 rank 2666
   16x Not Specified Not Specified

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 CXXC 508.namd_r(base, peak) 510.parest_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
------------------------------------------------------------------------------

==============================================================================
 CC  511.povray_r(base, peak) 526.blender_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
 FC  507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------------
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
GNU Fortran (GCC) 4.8.2
Copyright (C) 2013 Free Software Foundation, Inc.
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.
You may redistribute copies of GNU Fortran
under the terms of the GNU General Public License.
For more information about these matters, see the file named COPYING
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base,
      peak)
------------------------------------------------------------------------------
GNU Fortran (GCC) 4.8.2
Copyright (C) 2013 Free Software Foundation, Inc.
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You may redistribute copies of GNU Fortran
under the terms of the GNU General Public License.
For more information about these matters, see the file named COPYING
------------------------------------------------------------------------------

==============================================================================
 CC  521.wrf_r(base, peak) 527.cam4_r(base, peak)
------------------------------------------------------------------------------
GNU Fortran (GCC) 4.8.2
Copyright (C) 2013 Free Software Foundation, Inc.
GNU Fortran comes with NO WARRANTY, to the extent permitted by law.
You may redistribute copies of GNU Fortran
under the terms of the GNU General Public License.
For more information about these matters, see the file named COPYING
AOCC.LLVM.4.0.0.B35.2017_04_26 clang version 4.0.0 (CLANG:) (based on LLVM
  AOCC.LLVM.4.0.0.B35.2017_04_26)
Target: x86_64-unknown-linux-gnu
Thread model: posix
```

(Continued on next page)

Compiler Version Notes (Continued)

```
InstalledDir: /root/work/compilers/AOCC-1.0-Compiler/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`clang gfortran`

Benchmarks using both Fortran and C:
`clang gfortran`

Benchmarks using both C and C++:
`clang++ clang`

Benchmarks using Fortran, C, and C++:
`clang++ clang gfortran`

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_CASE_FLAG -fconvert=big-endian -DSPEC_LP64`
526.blender_r: `-funsigned-char -D__BOOL_DEFINED -DSPEC_LP64`
527.cam4_r: `-DSPEC_CASE_FLAG -DSPEC_LP64`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3 -ffast-math -march=znver1 -fstruct-layout=2
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2
-inline-threshold=1000 -z muldefs -ljemalloc

C++ benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3 -march=znver1 -mllvm -unroll-threshold=100
-finline-aggressive -fremap-arrays -inline-threshold=1000 -z muldefs
-ljemalloc

Fortran benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3(gfortran) -O3(clang) -mavx -madx
-funroll-loops -ffast-math -z muldefs -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc
-lgfortran -lamdlibm

Benchmarks using both Fortran and C:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3(clang) -ffast-math -march=znver1
-fstruct-layout=2 -mllvm -unroll-threshold=100 -fremap-arrays
-mno-avx2 -inline-threshold=1000 -O3(gfortran) -mavx -madx
-funroll-loops -z muldefs -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc
-lgfortran -lamdlibm

Benchmarks using both C and C++:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3 -ffast-math -march=znver1 -fstruct-layout=2
-mllvm -unroll-threshold=100 -fremap-arrays -mno-avx2
-inline-threshold=1000 -finline-aggressive -z muldefs -ljemalloc

Benchmarks using Fortran, C, and C++:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-disable-vect-cmp -O3(clang) -ffast-math -march=znver1
-fstruct-layout=2 -mllvm -unroll-threshold=100 -fremap-arrays
-mno-avx2 -inline-threshold=1000 -finline-aggressive -O3(gfortran)
-mavx -madx -funroll-loops -z muldefs -fplugin=dragonegg.so
-fplugin-arg-dragonegg-llvm-option=" -disable-vect-cmp" -ljemalloc

Peak Compiler Invocation

C benchmarks:
`clang`

C++ benchmarks:
`clang++`

Fortran benchmarks:
`clang gfortran`

Benchmarks using both Fortran and C:
`clang gfortran`

Benchmarks using both C and C++:
`clang++ clang`

Benchmarks using Fortran, C, and C++:
`clang++ clang gfortran`

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast
-march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively
-mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000
-ljemalloc

C++ benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast
-march=znver1 -finline-aggressive -mllvm -unroll-threshold=100
-fremap-arrays -inline-threshold=1000 -ljemalloc

Fortran benchmarks:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop
-O3(gfortran) -O3(clang) -mavx2 -madx -funroll-loops -ffast-math
-fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option="
-inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

521.wrf_r: -flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -O3(clang) -mavx -ffast-math -O3(gfortran) -funroll-loops -fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=" -inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm

527.cam4_r: -flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast -march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively -mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000 -O3(gfortran) -O3(clang) -mavx2 -madx -funroll-loops -ffast-math -fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=" -inline-threshold:1000" -ljemalloc -lgfortran -lamdlibm

Benchmarks using both C and C++:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast -march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively -mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000 -finline-aggressive -ljemalloc

Benchmarks using Fortran, C, and C++:
-flto -Wl, -plugin-opt= -merge-constant -lsr-in-nested-loop -Ofast -march=znver1 -fstruct-layout=3 -mllvm -vectorize-memory-aggressively -mno-avx2 -unroll-threshold=100 -fremap-arrays -inline-threshold=1000 -finline-aggressive -O3 -mavx2 -madx -funroll-loops -ffast-math -fplugin=dragonegg.so -fplugin-arg-dragonegg-llvm-option=" -inline-threshold:1000" -ljemalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/gcc.2018-02-16.html
http://www.spec.org/cpu2017/flags/aocc100-flags-revC-I.2018-02-16.html
http://www.spec.org/cpu2017/flags/amd1704-Dell-platform-revB-I.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/gcc.2018-02-16.xml
http://www.spec.org/cpu2017/flags/aocc100-flags-revC-I.2018-02-16.xml
http://www.spec.org/cpu2017/flags/amd1704-Dell-platform-revB-I.xml

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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